

GUIDELINES ON DISCARD CRITERIA FOR STEEL WIRE ROPES

Steel Wire Ropes, like any machine, deteriorate during storage as well as service .The deterioration and thus the life of the rope depends on various factors, in addition to the manufacturing quality of the rope, like storage, handling, maintenance and operating conditions .Obviously a busy and heavily stressed rope will deteriorate faster during use. It is, therefore, difficult to predict the life of a wire rope. However, generally accepted criteria for removal of General engineering ropes from service are as follows –

- When the over all diameter of the rope is reduced by 8 % or the outer wires have lost it's diameter by 33 % through wear. This reduction in diameter of the rope is measured on a portion of the rope which has been subjected to abrasion and stresses with respect to the portion of the rope which is subjected to stresses but not abrasion e.g. portions near drum or anchorage.
- When the total number of visible broken wires exceed 10 % of the total number of wires in the rope in a length equivalent to eight times the diameter of the rope .This condition is applicable where the breakages of wires are more or less evenly distributed in all the strands and not when the breakages are concentrated in only one or two strand of the rope.
- When there is evidence of considerable plastic wear or surface embrittlement.
- When the diameter of the rope has suddenly reduced or the lay length has suddenly increased or decreased .The decrease in lay length is usually associated with waviness in the rope.
- When there is evidence of severe corrosion like chain pitting. The condition may be alarming if in addition to corrosion, fatigue is also present.
- When there is any evidence of internal corrosion in the rope .This can be recognized by slackness of outer wires due to the internal wires corroding away or under wet conditions, a rusty emulsified liquid /substance exude between the strands under load.
- When the rope has been subjected to localized distortions as a result of mechanical damage , crushing , kink , bird cage , etc
- When the core of the rope has collapsed.
- When the rope has been subjected to a high temperature or heat due to fire.

- When the rope has been subjected to sever shock load or over load due to some accident with the equipment.

The above mentioned conditions are the general guide lines for discard of wire rope during use. However, the discretion of the user or an Inspecting officer, associated with the equipment or installation have be final for judging and ascertaining the safe condition of the rope , based on his earlier observations and experience on the particular installation. Hence, if the inspection of the rope leaves any doubt about its safety in the mind of user / Inspecting officer, the rope should be changed.

TYPES OF TYPICAL FAILURES

TERMINAL FAILURE



FATIGUE FAILURE



BIRDCAGE



SHOCK LOADING



ABRASION FAILURE



THERMAL DAMAGE



CORROSION

